



AMENDMENTS TO THE CLAIMS:

This listing of claims replaces all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Previously Amended) A control loop circuit for optimizing an output of a power supply under varying load conditions, the control loop circuit comprising:

a first control path coupled to the output of the power supply, the first control path including an error amplifier having an output, the error amplifier operative to generate an error signal to a main loop amplifier, the error signal representing the difference between a desired output and a sensed output; and

a second control path coupled to the output of the error amplifier and responsive to the error signal to generate a dynamic compensation signal, the second control path comprising:

input conversion circuitry for converting the error signal into a digital signal,

a digital-signal-processor coupled to the input conversion circuitry;

a look-up table for storing optimal compensation signal responses to detected error signals, the digital-signal-processor operative in response to the digitized error

signal to access the look-up table and identify the optimal compensation signal, and
generating the optimal signal; and

output conversion circuitry for connecting the optimal signal to the main loop
amplifier output.

2. (Cancelled)

3. (Previously Amended) A control loop circuit according to claim 1 wherein:
the look-up table comprises a RAM memory.

4. (Previously Amended) A control loop circuit according to claim 1 wherein the second
control path is disposed in parallel with the first control path.

5. (Previously Amended) A control loop circuit according to claim 1 wherein:
the second control path is selectively activated when the error signal is greater than a
predetermined threshold.

6. (Previously Amended) A control loop circuit according to claim 1 wherein:
the output conversion circuitry comprises a digital-to-analog converter.

7. (Previously Amended) A control loop circuit according to claim 1 wherein:

the first control path includes respective source and sink signal paths; and
the output conversion circuitry comprises respective source and sink digital-to-analog converters coupled to the respective source and sink signal paths.

8. (Cancelled)

9. (Cancelled)

10. (Previously Amended) A power supply system including:

a main loop amplifier circuit;

an output stage disposed in cascade with the main loop amplifier circuit; and

a control loop circuit, the control loop circuit including

a first control path coupled to the output stage and having an error amplifier, the error amplifier operative to generate an error signal to the main loop amplifier, the error signal representing the difference between a desired output and a sensed output; and

a second control path coupled to the error amplifier output and responsive to the error signal to generate a dynamic compensation signal, the second control path comprising:

input conversion circuitry for converting the error signal into a digital signal,

a digital-signal-processor coupled to the conversion circuitry;

a look-up table for storing optimal compensation signal responses to detected error signals, the digital-signal-processor operative in response to the digitized error signal to access the look-up table and identify the optimal compensation signal, and generating the optimal signal; and

output conversion circuitry for connecting the optimal signal to the main loop amplifier output.

11. (Cancelled)

12. (Previously Amended) A power supply system according to claim 10 wherein: the look-up table comprises a RAM memory.

13. (Previously Amended) A power supply system according to claim 10 wherein the second control path is disposed in parallel with the first control path.

14. (Previously Amended) A power supply system according to claim 10 wherein: the second control path is selectively activated when the error signal is greater than a predetermined threshold.

15. (Previously Amended) A power supply system according to claim 10 wherein: the output conversion circuitry comprises a digital-to-analog converter.

16. (Previously Amended) A power supply system according to claim 10 wherein:
the first control path includes respective source and sink signal paths; and
the output conversion circuitry comprises respective source and sink digital-to-analog converters coupled to the respective source and sink signal paths.

17. (Previously Amended) A method of controlling the output of a device under test (DUT) power supply, the method comprising:
generating a first compensated error signal based on the difference between a desired power supply output and an actual power supply output;
producing a dynamically compensated error signal in parallel with the first compensated error signal, producing comprising:
converting the first compensated error signal into a digital signal;
analyzing the digital signal;
generating a digital dynamically compensated error signal based on the analyzing the digital signal;
converting the digital dynamically compensated error signal to an analog dynamically compensated error signal; and
summing the first compensated error signal and the analog dynamically compensated error signals to generate an optimal compensation signal.

18. (Previously Amended) A method according to claim 17 wherein producing comprises being dependent on the magnitude of the first compensated error signal being above a pre-set threshold.

19. (Cancelled)